

SCIENCE AND TECHNOLOGY COMMITTEE

Second Report

**THE YEAR 2000 – COMPUTER
COMPLIANCE**

Volume I

Report and Proceedings of the Committee

*Ordered by The House of Commons to be printed
1st April 1998*

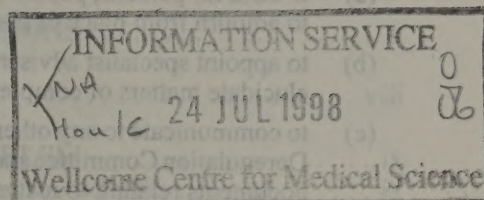
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SCIENCE AND TECHNOLOGY COMMITTEE



Year 2000 date conversion / Computer system

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The Science and Technology Committee is appointed under Standing Order No 152 to examine the expenditure, administration and policy of the Office of Science and Technology and associated public bodies.

The Committee consists of 11 Members. It has a quorum of three. Unless the House otherwise orders, all Members nominated to the Committee continue to be Members of it for the remainder of the Parliament.

The Committee has power:

- (a) to send for persons, papers and records, to sit notwithstanding any adjournment of the House, to adjourn from place to place, and to report from time to time;
- (b) to appoint specialist advisers either to supply information which is not readily available or to elucidate matters of complexity within the Committee's order of reference;
- (c) to communicate to any other such committee and to the Committee of Public Accounts, to the Deregulation Committee and to the Environmental Audit Committee its evidence and any other documents relating to matters of common interest; and
- (d) to meet concurrently with any other such committee for the purposes of deliberating, taking evidence, or considering draft reports.

The following were nominated Members of the Committee on 14 July 1997:

Mr David Atkinson	Mr Nigel Jones
Mr Nigel Beard	Dr Ashok Kumar
Dr Michael Clark	Mrs Caroline Spelman
Mrs Claire Curtis-Thomas	Dr Desmond Turner
Dr Ian Gibson	Dr Alan W Williams
Dr Lynne Jones	

Dr Michael Clark was elected Chairman on 30 July 1997.

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SUMMARY OF RECOMMENDATIONS AND CONCLUSIONS

- (a) We find the evidence that the century date change presents a genuine risk of malfunction in automated systems which have a date function overwhelmingly convincing (paragraph 5).
- (b) The combination of the immutable deadline, the worldwide context and complex inter-dependencies makes managing the century date change “a challenge without precedent” (paragraph 9).
- (c) We find it incontrovertible that, in the absence of adequate remedial action to address the century date change problem, there would be a significant negative impact on the UK’s future economic performance (paragraph 16).
- (d) We conclude that the century date change problem could, if not solved, cause severe difficulties in many critical public services (paragraph 19).
- (e) We recommend that central Government departments’ and agencies’ plans and progress be presented in a common format which allows for inevitable variations in the ways in which they are managing their Year 2000 programmes; and, to simplify the process of monitoring progress, a checklist should be developed, setting staged objectives and target dates, against which such reports could be judged (paragraph 24).
- (f) We recommend that the Chancellor of the Duchy of Lancaster publish departmental and agency plans and progress reports in conventional format as well as on the Internet (paragraph 25).
- (g) We recommend that the Chancellor of the Duchy of Lancaster reports to the House at the time of his quarterly reports on the state of readiness in departments and agencies through an oral, rather than written, statement (paragraph 26).
- (h) We recommend the same level of reporting on Year 2000 plans and progress for local authorities and other public bodies as we are suggesting for central Government departments and its agencies, for the same reasons. This should be organised centrally, through the relevant central Government department, with plans published and regular reports to Parliament. We further recommend that the Audit Commission and the Accounts Commission continue to monitor the millennium readiness projects of those parts of the public sector over which they have jurisdiction just as the National Audit Office does in respect of central Government (paragraph 27).
- (i) We congratulate the Health and Safety Executive for the robust approach it has taken in respect of high risk sites (paragraph 34).
- (j) We would have hoped that, with less than 90 weeks left before the millennium and the strong possibility of failures in systems before then, the Health and Safety Executive had raised awareness in all lower risk sites. We recommend that the Health and Safety Executive ensure that all such sites are made aware immediately of the problems which the century date change might cause and their responsibilities to make their systems compliant (paragraph 35).
- (k) We recommend that the Government ensure that each regulatory body is fully seized of the implications of the Year 2000 problem for the sectors they regulate and is promoting effective and timely remedial action on the part of individual organisations. We further recommend that each Government department produce regular reports to Parliament on the Year 2000 related activities of the regulatory bodies they sponsor (paragraph 36).

- (l) We conclude that organisations should not consider legal action as a primary remedy to Year 2000 problems but as a last resort and should not plan to enter litigation in preference to taking preventative action now. We strongly believe that this is a message which Action 2000 should promulgate widely and loudly (paragraph 40).
- (m) The risk of legal action on the part of those affected by century date related failures reinforces the need for all organisations to undertake thorough Year 2000 preparations to ensure that their systems, products and services are millennium ready. It should also be seen as a reason to keep thorough and accurate records of all remedial measures in case called upon by the courts to demonstrate that all reasonable steps to avoid system failures were taken (paragraph 41).
- (n) The Prime Minister has taken a lead in raising the profile of the century date change problem. We welcome this. The leading role adopted by the Prime Minister needs to be supported by a coherent, well-structured programme. We look to Action 2000, the Cabinet sub-committee (MISC 4) and the newly created central team in the Cabinet Office to provide this (paragraph 42).
- (o) We recommend that the Government ensure that financial constraints do not prevent the public sector achieving millennium readiness especially where safety-critical systems are involved (paragraph 45).
- (p) We recommend that if, at the next quarterly review, any department or agency is shown to have fallen further behind the timetable, the Chancellor of the Duchy of Lancaster and the CITU should instigate a thorough analysis of that department's Year 2000 programme and assist it to identify and prioritise its key systems (paragraph 47).
- (q) We recommend that each Secretary of State should review the millennium readiness programmes of the departments and public bodies they sponsor. We further recommend that the results of these reviews should be made available, as a supplement to the Chancellor of the Duchy of Lancaster's quarterly reports, so that they can both be scrutinised by experts and serve to reassure the public that adequate precautions are being taken (paragraph 48).
- (r) We remain concerned that progress in the National Health Service compared with other parts of the public sector appears slow: for instance, trusts were not required to provide full costings for readiness programmes until 31st March 1998 whereas central Government departments and agencies provided costings six months earlier. It is essential to guarantee that the National Health Service is fully prepared to manage the century date change (paragraph 51).
- (s) We recommend that progress reports on contingency planning for central departments and agencies should form an explicit part of the Chancellor of the Duchy of Lancaster's quarterly reviews and further that such reporting should be mirrored by all Ministers in respect of the public bodies which their departments sponsor (paragraph 53).
- (t) We recommend that Action 2000 develop a standard checklist to enable businesses to report progress in a common form as a matter of priority (paragraph 62).
- (u) Another means of reaching businesses directly would be to include information leaflets in telephone or other utility bills which are delivered to the vast majority of Small and Medium-sized Enterprises. We recommend that Action 2000 treat stimulating action on the part of Small and Medium-sized Enterprises with the highest priority and that it works with the Business Link network and other organisations in close contact with Small and Medium-sized Enterprises to ensure that its message is not only sent but received. (paragraph 63).

- (v) We do not accept that it is right to charge for upgrades necessitated by non-compliance of existing equipment. Depending upon the age of the current system and the terms under which it was supplied, companies have an obligation to provide suitable upgrades or replacements free of charge (paragraph 64).
- (w) While it is important that each organisation develop its own contingency plans, there is a role for Government to ensure that alternative arrangements are in place should there be any interruption in the ability of providers of essential public services to deliver (paragraph 66).
- (x) We recommend that trading standards officers should monitor use of the Millennium Safe logo and that suppliers found using the logo on non-compliant equipment should be penalised (paragraph 69).
- (y) We make below recommendations for a high profile advertising campaign on the part of Action 2000 (see recommendation bb). We recommend that the Millennium Safe scheme is an integral part of that campaign (paragraph 70).
- (z) We recommend that Action 2000 treat the dissemination of best practice as a key part of its campaign to stimulate organisations to take effective remedial action (paragraph 71).
- (aa) We recommend that the Government conduct audits in sample homes to test for millennium readiness in order to establish public confidence (paragraph 72).
- (bb) We recommend that Action 2000 conduct a high profile campaign disseminating widely, in clear and non-technical terms, the information needed to test domestic equipment for millennium compliance (paragraph 73).
- (cc) We endorse the Government's decision to put the matter on the agenda of various international summits, including this year's G8 meeting and the recent Europe-Asia summit. (paragraph 74). We recommend that the Government continue to take every opportunity to raise century date change issues with foreign Governments and to put the matter firmly on the agenda with our neighbours and trading partners all around the world (paragraph 74).
- (dd) We are concerned that developing countries' attempts to achieve millennium readiness should not be compromised by the provision of non-millennium compliant equipment from the UK (paragraph 76).
- (ee) We recommend that the need for prioritisation should be a central feature of the advice Action 2000 delivers (paragraph 77).
- (ff) We recommend that Action 2000 increase the profile and reach of its Millennium Bug Campaign. A campaign of the scale of 'Aids Awareness' in the 1980s or the more recent Inland Revenue 'Self Assessment' information campaign would be appropriate (paragraph 78).
- (gg) We welcome that: most companies will have to report on their year 2000 status at least once, and many twice, before the millennium. (paragraph 80).
- (hh) We recommend that Action 2000 commission a quarterly survey on progress in the business sector, broken down into categories including core services such as transport, telecommunications and other critical public services. We further recommend that the results of the survey be publicly and freely available (paragraph 81).
- (ii) We agree that it is important to keep demand for system changes down to a minimum (paragraph 86).

SECOND REPORT

The Science and Technology Committee has agreed to the following Report:—

THE YEAR 2000 – COMPUTER COMPLIANCE

PREFACE

1. We embarked on this inquiry in the autumn of 1997 against a background of increasing concern about the potential impact of the century date change on information technology and process control systems. Our intention is to present an objective assessment of the problems and the risks posed and to make recommendations for managing those risks.

2. We would like to thank all those who provided either written or oral evidence.¹ We received 77 memoranda and took oral evidence on six occasions. We are also most grateful for the help we have received from our specialist advisers for this inquiry—Mr Roger Baker of Itemplus Consulting; Mr John Ivinson, Director of John Ivinson and Associates and the British Computing Society's spokesperson on the Year 2000 issue; and Dr Geoffrey Robinson, former Director of IBM's Hursley Laboratory and Visiting Professor of Computer Science at Southampton University.

¹For lists of witnesses and memoranda see pp. xxxviii–xl.

CHAPTER ONE: THE CENTURY DATE CHANGE PROBLEM

The Cause of the Problem

3. The cause of the century date change problem sounds deceptively trivial. In the early days of computing—the 1960s and 1970s—computer memory and disk space were expensive. Consequently programmers developed shorthand ways for representing information. One way in which this was done was to store years as two digits rather than four so, for instance, ‘1967’ became ‘67’. This saved valuable memory for processing data and disk space for storing it. Programmers at that time did not expect the systems they were developing to remain in use for more than a few years. However the two digit convention persisted; partly because it became common, indeed standard, practice and partly because many of the systems now in use are based on, or use components from, older systems. Thus many of the systems which are today an integral part of our daily lives use only two digits to represent the year. In these systems, when the date changes from 1999 to 2000 the new year will be represented as 00. The effects that this will have on unmodified systems are difficult to predict, but could fall into one of a number of categories, for instance:

- some will default to 1900, or some other incorrect date, rather than to 2000;
- others will give unpredictable results when performing arithmetical operations or comparisons on the basis of two digit years, possibly with the loss or corruption of data;
- some systems may be able to cope but these are not easily identified without thorough checking.

4. Century date change problems could occur in a wide variety of systems, components and circumstances. Computers from the most powerful mainframes to the humblest personal computer (PC) may have problems. Electronic control systems—such as those in heating systems, fax machines or video recorders—use microprocessor chips which may have date problems built into them, even if they have no apparent date or time dependency. Such so-called ‘embedded systems’ are widely found in more complex, possibly safety-critical, monitoring and control systems used in industry.

5. The majority of our witnesses, including many from well-known organisations such as Shell UK, SmithKline Beecham, Barclays Bank, Sainsbury’s and the BBC, agreed that the century date change posed a genuine and significant problem, although there were slight differences in their assessments of scale and extent.² For instance, Morgan Stanley told us that “to date, we have encountered Year 2000 date problems in nearly all of our internally developed systems ... we have also found that networks, telecommunications infrastructure, and building systems are affected. In fact, the central building management system in our ... office which controls and monitors fire alarm, water detection and other safety systems has defective embedded chips”.³ Hundreds of major organisations from both the public and private sectors across the UK and abroad have tested their systems for millennium compliance, have found them wanting, and have committed substantial resources to remedial action. So while some systems, including those without any manifest or embedded date capability, will continue to function normally over the millennium, **we find the evidence that the century date change presents a genuine risk of malfunction in automated systems which have a date function overwhelmingly convincing.**

The Nature of the Problem

6. Many of our witnesses agreed that, superficially, the century date change presents a series of isolated technical problems to which there are technical solutions: “all individual technical date change problems are solvable”.⁴ However the majority, including BT, the Chancellor of the Duchy of Lancaster, and Railtrack, also agreed that the century date change is neither a

²eg. Ev.p. 183.

³Ev.p. 168.

⁴Ev.p. 105.

single nor just a technical problem.⁵ Computers have become ubiquitous—“we live in an automated world and microchips have permeated nearly all areas of our personal and business lives”.⁶ So while the causes of the problem are technical, the consequences of a failure to correct systems could extend throughout the business, economic and social spheres. Simultaneous and extended failures in key systems could present a risk to personal health or well-being as well as to future economic performance. The greater challenge, therefore, is not the correcting or replacing of faulty software and hardware but managing the process of implementation and completion of remedial action with the resources available and within the time remaining.⁷ As the NHS Confederation told us the “Year 2000 is mainly a problem of management. The technical changes tend to be fairly simple but organising, implementing and paying for them is difficult”.⁸

7. Many witnesses pointed out that, even if an organisation ensured that all its own systems were millennium ready, it would still not be possible to guarantee that it was not affected by century date change related problems. For instance, IBM told us that they must “also ensure that their systems are not contaminated by two-digit dates from computers linked to their own by public or private network”.⁹ This information chain aspect of the problem not only affects organisations where their networks are directly connected to others. A date change related failure which causes one particular company to have errors, for example in ordering, dispatching or paying for goods or services, could have severe consequences to other, millennium compliant, companies in the supply chain. This may be a particular problem for organisations which hold minimal stock and rely on ‘just in time’ deliveries as they may not have the ability to withstand even minor delays in deliveries or collections.¹⁰ Morgan Stanley told us that “external product and service providers represent one of the greatest areas of risk”¹¹ and, similarly SmithKline Beecham stated that “arguably the biggest threat to our company comes from non-compliant suppliers, customers and other business partners”.¹² Thus the implications of non-millennium compliance are wider than a single business. Companies cannot continue to trade if their suppliers cannot provide the goods they need or customers are unable to purchase their products. Left uncorrected, century date change problems could affect the integrity of entire business chains.

8. Such inter-dependencies between organisations are not restricted to the UK.¹³ Many organisations rely on suppliers, service providers, customers or business partners in other countries: for instance, Marks and Spencer told us “we deal with ... a long international supply chain, on whom we are dependent for merchandise and services”¹⁴ and EDS that its operations in the UK “could be seriously affected by the failure of other countries to fix their problems”.¹⁵ Moreover, any organisation with business connections overseas is likely to depend on international telecommunications and banking systems which themselves have to be made millennium ready. As the British Bankers’ Association (BBA) stated “it is difficult to exaggerate the scale of the impact on banks and through them the UK economy if they and their customers and counterparties ... abroad are not Year 2000 compliant”.¹⁶

9. It is the combination of these factors—the immutable deadline, the worldwide context and complex inter-dependencies—that makes managing the century date change “a challenge without precedent”.¹⁷

⁵ eg. Ev.p. 147.

⁶ Ev.p. 141.

⁷ Ev.p. 227. See also eg. Ev.pp. 130 and 138–9.

⁸ Ev.p. 78.

⁹ Ev. p. 57.

¹⁰ Ev.p. 151.

¹¹ Ev.p. 168.

¹² Ev.p. 185.

¹³ eg. Ev.p. 131.

¹⁴ Ev.p. 192.

¹⁵ Ev.p. 131.

¹⁶ Ev.p. 108.

¹⁷ Ev.p. 186.

When will Problems Occur?

10. Many information technology applications have the capability to look forward, or calculate long-term projections, well beyond the millennium and consequently some systems that are not millennium compliant may fail before the century date change itself. As IBM told us “really the issue of the Year 2000 is not the issue of the calendar event; it is the question of whether or not the computer system can process a date which is beyond December 31, 1999”.¹⁸ There are already anecdotal examples of errors arising from inabilities to manage the century date change such as instances of credit card payments not being processed properly because the expiry date on the card was beyond 31st December 1999.¹⁹ According to a survey undertaken by PA Consulting, 86% of organisations in the UK believe that they will experience some century date change related errors before the Year 2000.²⁰

11. The difficulties that computer and embedded systems may have with the century date change from 1999 to 2000 is certainly the most easily recognised aspect of the Year 2000 problem but there are other critical dates which could trigger system errors. For instance, systems which handle the century date change perfectly could be affected by problems associated with managing dates around 29th February 2000. Past century base years—such as 1800 and 1900—although divisible by four, were not leap years but the millennium base year is. So, whilst much of the speculation over the century date change problem has focussed on what may or may not happen at midnight on 31st December 1999, and it is indeed likely that some systems will actually stop functioning normally at this time, in practice the precise time of the ‘millennium moment’ may well go relatively unnoticed (in computer terms at least). Other dates which witnesses considered to be potentially critical are listed in annex A.

Millennium Compliance

12. The British Standards Institute, in collaboration with a number of other organisations, have developed a definition for Year 2000 conformity (see annex B). This definition stipulates that “Year 2000 conformity shall mean that neither performance nor functionality is affected by dates prior to, during or after the Year 2000”.²¹ We agree that the ideal would be for all systems to manage the century date change properly—that is to be ‘millennium compliant’. It is, however, arguable whether it is necessary, or indeed possible, to ensure that all existing systems meet such an exacting criterion. In some cases it may be more effective to replace existing systems which are not, or have not been proven to be, millennium compliant with new systems that will manage the century date change correctly. In other cases, where non-compliance is unlikely to affect performance or where the system is only of minor significance, leaving non-compliant systems in place may be acceptable. The key objective is that individuals and organisations are adequately prepared for the millennium—‘millennium ready’ rather than millennium compliant—and equipped with compliant systems or prepared to manage the consequences of non-compliance. The challenge that faces us, then, is to ensure that computer and embedded systems function in a manner that allows central Government, local government (including essential social services), businesses and society to continue to function as normally as possible now, over the millennium and afterwards.

¹⁸Q. 218.

¹⁹Q. 8. See also Parliamentary Office of Science and Technology, *Computer Systems and the Millennium*, POST Note 89, p. 2.

²⁰PA Consulting Group, *Defusing the Millennium Time Bomb: An International Survey of Awareness and Readiness*, 1997, p. 5.

²¹*Definition of the Year 2000 Conformity*, prepared by British Standards Institute, (Document ref: DISC PD2000-1).

CHAPTER TWO: SCALE AND POTENTIAL IMPACT OF THE PROBLEM

13. Although most of our witnesses agreed that the century date change could potentially force errors in almost any system, product or process that incorporates a date reference, there are various estimates of the number of systems that are likely to be affected.²² Taskforce 2000 told us that “most computer systems (large and small, old and new) and almost countless ‘embedded’ microprocessor chips are potentially affected”.²³ Several bodies have recently undertaken surveys to ascertain precisely how many systems and organisations will be affected. In 1997, PA Consulting found, in a comprehensive survey in the UK and Ireland, that only 3% of organisations felt that their systems would be unaffected by the century date change, with a further 6% not knowing whether their’s would be or not. The remaining 91% of respondents believed that the century date change either had or would have an impact on their organisation (see table 1).

Table 1

Expected Impact of the Century Date Change on Organisations	
Expected Impact	Percentage
Not impacted	3
Already impacted	20
Impact in 1997	3
Impact in 1998-99	51
Impact in 2000	17
Did not know	6
Total	100

Source: *Defusing the Millennium Time Bomb*, page 18.

14. Taskforce 2000 told us that, left uncorrected, “80 per cent of computer systems of all kinds ... and something between 10 and 30 per cent of embedded systems will fail in one way or another”.²⁴ Similarly, Greenwich Mean Time, a company formed specifically to address issues arising from the Year 2000 problem in PCs, told us that the majority of the 20 million PCs that are estimated to be in use in the UK at present will experience some form of hardware or software disruption.²⁵

15. While we can quantify the number of systems likely to be affected, such statistics provide no qualitative indication of the extent to which organisations are likely to be impacted. There is an enormous difference between the consequences of failures in minor systems, like a pocket calculator, and a failure in a system which performs business or safety-critical functions. Moreover, while organisations may be able to cope with the failure of one system without any serious repercussions, the outcome may be completely different if a number of systems, minor or otherwise, fail simultaneously. Consequently raw statistics give little indication of the nature or degree of risk that century date change related errors may pose either socially or economically. We attempt to address this issue below but, in doing so, are conscious that these assessments are based on the assumption that no corrective or preparatory measures had been taken.

²²eg. Ev.pp. 24 and 161.

²³Ev.p. 1.

²⁴Q. 6.

²⁵Ev.p. 164.

Potential Impact on Businesses and the Economy

16. The London Stock Exchange pointed out that there were few areas of commercial life “untouched by the implications of the Year 2000 date change” and most of our witnesses from the business community agreed that the consequences of failing to take remedial action would be significant.²⁶ For instance, SmithKline Beecham told us that “left unaddressed, the Year 2000 problem would arguably have been the biggest threat to business continuity that SmithKline Beecham has ever faced”.²⁷ Railtrack told us “unless addressed ... the problem would cause serious and prolonged damage to the operation and hence the viability of the whole of the rail industry”.²⁸ Shell UK believe that, had they taken no corrective action, “there would have been serious consequences in terms of failure to continue to supply oil and gas”.²⁹ Failures to continue to operate on such a scale would clearly not only have a detrimental impact on national GDP but would also have implications for the performance of other companies reliant upon the services provided by those that had failed. Therefore, even though the implications of non-compliance vary from system to system, **we find it incontrovertible that, in the absence of adequate remedial action to address the century date change problem, there would be a significant negative impact on the UK’s future economic performance.**

Potential Impact on Society

17. Other witnesses pointed to the potential of the century date change problem to affect individual citizens beyond the inevitable consequences of a downturn in economic performance. The Consumers’ Association told us that “there is ... the possibility of consumers suffering financial loss, major inconvenience or breach of data protection safeguards” as a result of failures in, for example, transactions, billing and credit rating systems in banks or credit card companies; insurance company records; social security payment systems; workplace salary systems; or local authority administration systems.³⁰

18. Malfunctions or failures in systems which perform safety-critical or essential operations, such as air traffic control systems; road or rail signalling; medical equipment; safety control equipment in factories or equipment controlling the labelling, storage and distribution of perishable foods, would present more fundamental risks to the public. For example, Thames Water, whose operational monitoring and control systems for major water and waste processes are dependent on embedded systems, told us “any failure of our services for a significant period of time would have a potentially serious impact on the public health of millions of people”.³¹

19. Assessments of the nature of the problem and the potential impact that widespread malfunctions in computer and embedded systems could have on the economy, the national infrastructure and society at large, are important as they provide the imperative behind remedial action. However, as the Institution of Electrical Engineers told us, there has been “much ‘hype’ and scare mongering” in some reporting of Year 2000 issues and that, at times, “the consequences of failure to deal with the problems have been exaggerated”.³² Though predictions of doom generally have failed to account for the fact that some remedial action has already been, and continues to be, taken **we, like the majority of our witnesses, conclude that the century date change problem could, if not solved, cause severe difficulties in many critical public services.**

²⁶ Ev.p. 170.

²⁷ Ev.p. 183.

²⁸ Ev.p. 139.

²⁹ Q. 145.

³⁰ Ev.p. 221.

³¹ Ev.p. 159.

³² Ev.p. 161.

CHAPTER THREE: ROLES AND RESPONSIBILITIES

Public Sector

CENTRAL GOVERNMENT DEPARTMENTS AND AGENCIES

20. The Government clearly has a responsibility to ensure that its own systems are millennium ready. In respect of central Government and its agencies, the Chancellor of the Duchy of Lancaster, the Rt Hon Dr David Clark, has been given overall responsibility to ensure that each department and agency is aware of the century date change problem and has in place realistic and costed plans for remedial action.³³ Responsibility for drawing up specific plans and ensuring that they are implemented rests with individual departments and agencies, and their Ministers. The Chancellor of the Duchy of Lancaster has no authority to compel central Government departments or agencies to take action but, as he told us, he does have the tools of publicity and persuasion at his disposal.³⁴

21. The Chancellor of the Duchy of Lancaster is also responsible for ensuring that the Government's response to the problems raised by the century date change is coherent and co-ordinated and, through the Central Information Technology Unit (CITU), that adequate support and advice is made available to departments and agencies. The CITU, in turn, has commissioned the Central Computer and Telecommunications Agency (CCTA) to raise awareness, advise departments on best practice and tackle issues of common concern.³⁵

22. The Chancellor of the Duchy of Lancaster has also undertaken to monitor progress within central Government and its agencies and to report his findings both to Parliament and to the public at regular intervals. He made his first report to Parliament on 27th November 1997 and at the same time departments' and agencies' plans were published on the Internet. These plans were up-dated on 3rd March 1998. Further information on central Government's progress on millennium readiness has been put in the public domain by publication of the National Audit Office's (NAO) report, *Managing the Millennium Threat*.³⁶ (We understand that a further NAO report will be produced shortly.)

23. Despite these activities some witnesses called for greater openness on the part of Government, arguing that this would serve several useful functions, chiefly:

- to reassure the public that Government systems would not fail at the millennium and that provision of Government services would continue uninterrupted;
- to expose the plans to the scrutiny of independent experts who may be able to spot weaknesses and offer advice; and
- to serve to demonstrate to other organisations the seriousness with which the Government is tackling the issue and thus encourage them to take concerted action themselves.

It is, however, questionable whether any one reporting mechanism could achieve all these objectives.

24. We welcome the openness with which the Chancellor of the Duchy of Lancaster has made information on the Government's plans available but we agree that there would be merit in going further. We are not convinced that the information currently provided in the departmental and agency plans is of sufficient quality or detail to enable rigorous or effective scrutiny nor are we convinced that such scrutiny will be conducted unless a specific body is charged to do so. It may be that this function will fall to the newly created 'central team' of experts from Whitehall and

³³Q. 396.

³⁴Q. 404.

³⁵National Audit Office, Session 1997-98, *Managing the Millennium Threat*, May 1997, HC 3, para 2.3.

³⁶*Ibid.*

the business community, as announced by the Prime Minister on 30th March 1998. **We recommend that central Government departments' and agencies' plans and progress be presented in a common format which allows for inevitable variations in the ways in which they are managing their Year 2000 programmes; and, to simplify the process of monitoring progress, a checklist should be developed, setting staged objectives and target dates, against which such reports could be judged.**

25. There is a risk that publication restricted to the Internet, which by definition primarily reaches only those with IT facilities and skills, could serve to reinforce the false perception that the century date change is solely an issue for the IT industry and those with expertise in IT. Departmental and agency plans would be more widely available if they were published in a traditional format. **We recommend that the Chancellor of the Duchy of Lancaster publish departmental and agency plans and progress reports in conventional format as well as on the Internet.**

26. We were also concerned to note that the Chancellor of the Duchy of Lancaster's most recent report to the House of the Commons on the state of readiness of departments and agencies was made in the form of a response to a written question. While this is undoubtedly an effective method of keeping the House informed we are not convinced that it is the most appropriate method of ensuring that the information reaches a wider audience or of indicating the importance that the Government places upon the issue of millennium readiness. Statements made in the House in person attract a higher profile and therefore **we recommend that the Chancellor of the Duchy of Lancaster reports to the House, at the time of his quarterly reports on the state of readiness in departments and agencies, through an oral, rather than written, statement.**

Other Public Bodies

27. Responsibilities for Year 2000 readiness in local authorities and other public bodies, such as health authorities and NHS trusts, fit into a model similar to that which we have already spelt out for central Government (see para 20). Local authorities in England, for example, are responsible for tackling all Year 2000 issues within their own organisations but, as central Government responsibility for local government rests with the Department of the Environment, Transport and the Regions, the Deputy Prime Minister has overall responsibility for ensuring that action is taken. Similarly, although board members in NHS trusts have day to day responsibility for century date change issues, it is for the NHS Executive and, ultimately, the Secretary of State for Health to ensure that each trust is taking effective action.³⁷ However, unlike the case of central Government, no open or centralised reporting mechanism has been introduced for other public bodies. We believe that this is a weakness. Openness in respect of millennium readiness would deliver the same benefits of public scrutiny and public reassurance to the wider public sector as to central Government. **Therefore we recommend the same level of reporting on Year 2000 plans and progress for local authorities and other public bodies as we are suggesting for central Government departments and its agencies, for the same reasons. This should be organised centrally, through the relevant central Government department, with plans published and regular reports to Parliament. We further recommend that the Audit Commission and the Accounts Commission continue to monitor the millennium readiness projects of those parts of the public sector over which they have jurisdiction just as the NAO does in respect of central Government.**

Private Sector

28. Responsibility for addressing the century date change issue in the private sector is more clear cut. As several of our witnesses confirmed, millennium readiness is, in many cases, a matter of business survival. Therefore millennium readiness is a matter for chief executives, owners, and directors who have a statutory duty to exercise due care over the operation of their business. Each business or organisation needs to take strategic decisions, based on its own circumstances, resources and objectives, over whether to fix systems affected by the century date

³⁷Q. 373.

change, replace them with compliant systems, or cease performing the operations which are dependent on those systems. Nevertheless, the Government, as it has accepted, does have a role to play, both as a motivator and as a facilitator, flowing in part from its responsibility to provide stable conditions for economic growth and in part from its responsibility to protect citizens from disruption.

TASKFORCE 2000

29. The Government's first response to its duty to stimulate action in the private sector was to collaborate in the creation of Taskforce 2000, a not-for-profit organisation established in August 1996 to raise awareness of the Year 2000 problem with senior decision-makers in industry and commerce.³⁸ It was funded partly by private companies but the majority of resources came from the Department of Trade and Industry (DTI) which provided £350,000 and, from January 1997, a secondee.³⁹ Taskforce 2000 also includes representatives from the Confederation of British Industry (CBI), the Computing Services and Software Association, the Federation of the Electronics Industry and the National Computing Centre.

30. Most witnesses felt that Taskforce 2000 had done much to increase levels of awareness of the century date change problem in UK businesses.⁴⁰ Nevertheless, by the summer of 1997 there were concerns that more needed to be done to turn awareness into action.⁴¹ Indeed, Taskforce 2000 itself subscribed to such views, telling us last November that awareness levels in the UK "are very high ... but we have not really been very successful when it comes down to really [making companies] understand" the need for action.⁴² In response to such concerns the DTI launched Action 2000 and announced that DTI funding for Taskforce 2000 would cease on 31st March 1998 "or when the £350,000 to which we are committed has been spent, whichever is the sooner".⁴³

ACTION 2000

31. The creation of Action 2000 was announced at the end of September 1997. Its purpose is "to focus on the action that businesses need to take to fix their systems, rather than simply raising awareness".⁴⁴ It is charged with co-ordinating work on Year 2000 issues across the private sector, providing easy access to best practice for businesses, identifying ways to address shortages of people with relevant skills and monitoring progress. The DTI initially announced that £1 million would be made available to finance Action 2000 activities in the first year although successive increases have been announced, raising this sum to £17 million.⁴⁵

Regulatory Bodies

32. There are also various public sector regulatory bodies which have generic responsibilities to ensure that the organisations they regulate operate within certain parameters. One of the most critical responsibilities of all regulatory bodies falls to the Health and Safety Executive which has a statutory duty to ensure that 'duty-holders'—usually employers—in factories, mines, farms, railways, chemical plants and offshore and nuclear installations, comply with the provisions of health and safety legislation. Where, therefore, failures in systems resulting from an inability to manage the century date might pose a risk either to the workforce or the public, the HSE has a role in ensuring that appropriate precautions are taken by those controlling such sites. Local authority enforcement officers have similar responsibilities in respect of a wide range of premises including shops, warehouses, most offices, hotels and leisure centres.

³⁸ Ev.p. 1.

³⁹ Ev.p. 34.

⁴⁰ eg. Q. 116.

⁴¹ Ev.p. 34. *See also* Q. 116.

⁴² Q. 8.

⁴³ Ev.p. 34.

⁴⁴ DTI Press Notice, P/97/618, 29 September 1997.

⁴⁵ Speech by the Prime Minister on *The Millennium Bug* to the Action 2000/Midland Bank Conference, 30 March 1998.

33. The HSE told us that it was “fully seized of the safety-critical implications of computer software failure”.⁴⁶ Its approach to enforcement consists of four elements:

- conducting research to gain a better understanding of the nature and scope of the problem;
- raising awareness among duty-holders;
- co-operating with other agencies such as the DTI and Action 2000; and
- formal enforcement through the use of improvement and prohibition notices and, if necessary, through prosecution.⁴⁷

34. This is a commendable approach to take. We were reassured by what the HSE told us regarding high risk sites. For instance, in respect of nuclear installations, the HSE said that “none of the safety-critical systems related to the nuclear reactor itself are time/date dependent. We are satisfied on that point. Neither is there any linkage with other systems where there is such a dependency”.⁴⁸ Nevertheless, failures in other systems at such sites could still cause problems which might, in turn “impair the command structure's ability to cope with running the plant as a whole”.⁴⁹ Consequently, operators of such sites are required to demonstrate to the HSE that they are addressing century date change problems in all systems, not just safety-critical ones. The HSE also told us that they would be visiting each high risk site at least once, and probably more often, before the millennium. **We congratulate the HSE for the robust approach it has taken in respect of high risk sites.**

35. We are, however, concerned that there seems to be a distinct lack of urgency on the part of the HSE with respect to the lower risk sites within their remit. They told us that “this coming year we ... are in the awareness raising phase, getting information out to people. We will learn more about the size of the problem and we will learn more about the specifics of the problem. There may be some sectors ... where we need to do more”.⁵⁰ **We would have hoped that, with less than 90 weeks left before the millennium and the strong possibility of failures in systems before then, the HSE had raised awareness in all lower risk sites. We recommend that the HSE ensure that all such sites are made aware immediately of the problems which the century date change might cause and their responsibilities to make their systems compliant.**

36. Other regulatory authorities, such as the Bank of England, the Civil Aviation Authority or the Office of Electricity Regulation, also have a duty to ensure that the organisations they regulate continue to operate in particular ways, often with regard to continuity of provision of service or the provision of services in a timely and safe manner. Where such operations could be affected by century date change related failures, regulators need to ensure that effective remedial action is being taken. Regulatory authorities have a crucial role to play in galvanising into action those sectors for which they have responsibility but it has not been possible, nor would it be appropriate, for us to scrutinise the Year 2000 related activities of each one. **We recommend that the Government ensure that each regulatory body is fully seized of the implications of the Year 2000 problem for the sectors they regulate and is promoting effective and timely remedial action on the part of individual organisations. We further recommend that each Government department produce regular reports to Parliament on the Year 2000 related activities of the regulatory bodies they sponsor.**

Motivators in the Private Sector

37. There are numerous others, many in the private sector, that also have a role in encouraging

⁴⁶Ev.p. 98.

⁴⁷Q. 438. See also Ev.p. 98.

⁴⁸Q. 468.

⁴⁹Q. 468.

⁵⁰Q. 454.

organisations and individuals to make adequate preparations for the century date change. Many, as some of our witnesses demonstrated, are stimulating remedial action as a result of enlightened self-interest, realising that they are critically dependent on other organisations—their suppliers and customers for instance—also being ready.⁵¹ Some banks, recognising that there are “significant implications ... if business customers are seriously disrupted or even go out of business because of Year 2000 problems”, have sought to raise awareness and offer advice to business customers.⁵² Similarly, some insurance companies are raising awareness among their policy-holders, perhaps seeking to reduce the possibility or value of claims against Year 2000 related failures.⁵³

38. Others have more immediate reasons for concerning themselves with the precautions taken by organisations to address Year 2000 issues. Auditors have an obligation to “make appropriate enquiries to obtain a sufficient understanding of any material impact on the financial statements subject to their audit”⁵⁴ and have been issued with guidance from the Institute of Chartered Accountants of England and Wales. This suggests the enquiries that it is appropriate for them to make in relation to millennium readiness and the circumstances under which it would be appropriate to qualify the accounts of companies not making sufficient progress.

Legal Requirements for Millennium Readiness

39. There is no specific legislation which requires organisations or individuals to ensure that their systems are millennium ready. Nevertheless, organisations in some sectors may find their ability to operate in accordance with legislation compromised by Year 2000 problems. For example local authorities have a statutory obligation to ensure the provision of certain services; organisations with systems which process personal data are required to conform with the provisions of data protection legislation;⁵⁵ and those organisations subject to health and safety legislation could find themselves subject to prosecution if systems' failures compromise their ability to comply. Indeed, we were told that “there is already a formidable range of legal sanctions—from company law to health and safety to investor protection and beyond—which may eventually be invoked against companies which fail to sort out their Year 2000 problems”.⁵⁶ Redress could be sought in a number of circumstances, for instance, by those attempting to recover the costs of replacing deficient equipment or where systems failure causes interruption of business, damage to property or personal injury. Many organisations or individuals may seek redress under the Supply and Sale of Goods Act 1994 which brought in the implied term that goods must be of ‘satisfactory quality’ and which covers, as Allen and Overy told us, goods containing software or embedded chips.⁵⁷

40. Nevertheless, many of our witnesses agreed with Barclays Bank who told us “relying on legal remedies to address the problem is illusory”.⁵⁸ Shell UK told us that “the consequences of non-compliance are usually much greater than the cost of remedy” and the BBA that “litigation is not a solution. Businesses cannot afford to wait ... to deal with the problem”.⁵⁹ For many businesses recourse to legal action after the event would be too late to be of benefit, especially if they are unable to continue to trade for any significant length of time. Moreover, as Allen and Overy pointed out, “the fact that a legal remedy is available does not mean a consumer will always be able to enforce that remedy. In particular, where a supplier of defective goods is forced into insolvency ... because of a multiplicity of claims, individual consumers are unlikely to recover from that supplier”.⁶⁰ Those in England, Wales and Northern Ireland seeking redress under the sale of goods legislation must do so within the statutory period of six years

⁵¹eg. Q. 158.

⁵²Ev.p. 109.

⁵³Ev.p. 206.

⁵⁴Institute of Chartered Accountants, *Audit Faculty Technical Release: The Year 2000 Systems Issue: Audit Implications*, September 1997, p. 1.

⁵⁵eg. Ev.p. 123.

⁵⁶Ev.p. 128.

⁵⁷Ev.p. 218.

⁵⁸Ev.p. 134.

⁵⁹Q. 160 and Ev.p. 110.

⁶⁰Ev.p. 219.

from the date of purchase which means that equipment or software failures at the millennium will only be actionable if the goods were supplied after 1993.⁶¹ (Consumers in Scotland have a period of up to five years after damage to a product occurs, in which to make a claim.) Moreover, organisations would be unwise to rely on insurance policies to cover legal costs or damages as many insurance companies are considering introducing Year 2000 exclusion clauses.⁶² For these reasons **we conclude that organisations should not consider legal action as a primary remedy to Year 2000 problems but as a last resort and should not plan to enter litigation in preference to taking preventative action now. We strongly believe that this is a message which Action 2000 should promulgate widely and loudly.**

41. While we firmly believe that organisations would be foolish to rely on legal redress or compensation to mitigate the consequences of non-compliance, it is likely that many dissatisfied with goods or services that have failed to function properly will seek legal redress. Indeed, Masons Solicitors told us that they expect a substantial number of legal actions to arise as a result of the century date change.⁶³ Taskforce 2000 stated that there was hardly a firm of solicitors in the City of London that did not have a partner specialising in millennium issues.⁶⁴ **The risk of legal action on the part of those affected by century date related failures reinforces the need for all organisations to undertake thorough Year 2000 preparations to ensure that their systems, products and services are millennium ready. It should also be seen as a reason to keep thorough and accurate records of all remedial measures in case called upon by the courts to demonstrate that all reasonable steps to avoid system failures were taken.**

Leadership

42. Despite all the different factors that may stimulate organisations to address Year 2000 issues, and all the people and organisations who are playing a role in encouraging them to do so, several witnesses regretted that there was no overall source providing information, co-ordination and direction for the UK as a whole on Year 2000 issues. Coopers and Lybrand told us that “one of the major problems ... is the lack of co-ordination between all the different groups working to try to resolve the problem”⁶⁵ and the UK Year 2000 Interest Group that “strong leadership is required”.⁶⁶ The Government is the only organisation that can provide such co-ordination and leadership across all sectors and indeed a number of different Committees and groups have been formed to tackle issues which affect both the public and private sectors. Moreover, since starting our inquiry, **the Prime Minister has taken a lead in raising the profile of the century date change problem. We welcome this. The leading role adopted by the Prime Minister needs to be supported by a coherent, well-structured programme. We look to Action 2000, the Cabinet sub-committee (MISC 4) and the newly created central team in the Cabinet Office to provide this.**

⁶¹The Sale of Goods Act 1979, as amended by the Sale and Supply of Goods Act 1994.

⁶²Ev.p. 207.

⁶³Ev.p. 219.

⁶⁴Q. 4.

⁶⁵Ev.p. 187.

⁶⁶Ev.p. 179.

CHAPTER FOUR: SOLVING THE PROBLEM

Public Sector

CENTRAL GOVERNMENT DEPARTMENTS AND AGENCIES

43. As the Chancellor of the Duchy of Lancaster has acknowledged, the threat posed by the century date change to “central Government and agencies is very serious but varies according to the nature of each organisation”.⁶⁷ Many essential Government functions, such as benefit payments and taxation, depend on mainframe computers; Government establishments may contain embedded processors and Government “as a whole is increasingly dependent on personal computers”.⁶⁸ The problem was recognised by the previous administration and plans were put in place to identify and correct Government systems that may be susceptible to date change problems. In 1996 the CITU drew up a programme which set specific targets for all departments and agencies:

- that inventories and audits should be complete by January 1997;
- that all departments and agencies should have prioritised, costed and timed programmes in place by October 1997; and
- that testing of all modified systems should be completed by January 1999.

Since September 1996, Government purchasing policy has required that all new equipment should be millennium compliant. The CITU and the CCTA have also been active in advising departments and disseminating best practice.⁶⁹

44. Such momentum was reinforced by the current Chancellor of the Duchy of Lancaster who, when he came into office, asked to receive “detailed and costed plans, showing how ... departments and agencies were tackling the problem” and who has undertaken to review such plans each quarter.⁷⁰ The Chancellor of the Duchy of Lancaster also told us that the CITU would be responsible for verifying the efficacy of departmental and agency plans and, to some degree, checking that their remedial action was effective.⁷¹ He also assured us that experts from the CITU would be made available to any department or agency that was seen to be falling behind schedule.⁷²

45. Whilst, in principle, we find this programme to be satisfactory, we have two major concerns. The first is in relation to the costs incurred by departments and agencies in their Year 2000 programmes, all of which the Government expects to be met from within existing allocations. The departmental and agency plans submitted in November 1997 projected an overall cost of some £370 million (naturally with great variations between different parts of Government). Witnesses made two points in connection with this figure: first that it seemed unrealistically low⁷³ and, second, that experience in the private sector tended to show that the costs of Year 2000 programmes increased during implementation and as organisations came to understand more fully the amount of work that was necessary.⁷⁴ Indeed, up-dated plans show that projections of total cost rose by £23 million to £393 million between October 1997 and February 1998. In response to the first of these points the Chancellor of the Duchy of Lancaster told us that the figure “is not really very much out of kilter” with other organisations of a similar size with similar IT dependencies.⁷⁵ Nevertheless the Chancellor of the Duchy of Lancaster acknowledged that costs tended to rise and told us that departments would not be held to the

⁶⁷Ev.p. 88.

⁶⁸*Ibid.*

⁶⁹Ev.p. 89.

⁷⁰Ev.pp. 88–9.

⁷¹QQ. 407 and 428.

⁷²Q. 407.

⁷³eg. Ev.p. 58.

⁷⁴eg. Ev.p. 168.

⁷⁵Q. 402.

figures they had reported—"it does not matter what the cost is, this has got to be fixed".⁷⁶ However, he also told us that if costs were to rise further, departments and agencies would still be expected to meet those costs from within existing allocations.⁷⁷ We accept that money alone is unlikely to solve Year 2000 problems but we are concerned that such a strict approach may limit departments' and agencies' ability to achieve maximum possible readiness for the century date change. It may also involve them in even higher remedial costs later. We are also concerned that there should be explicit recognition of the opportunity costs, to enable informed prioritisation. For instance, the NHS Confederation told us that while diverting funding to Year 2000 work would not have a direct effect on clinical practice, there would be consequences for other projects dependent on capital investment, such as the move towards single sex wards.⁷⁸ **We recommend that the Government ensure that financial constraints do not prevent the public sector achieving millennium readiness especially where safety-critical systems are involved.**

46. Our second concern relates to the amount of time left for projects to be completed. Experience shows that IT projects frequently fall behind the timetable set for them. There is already evidence that this is happening to Year 2000 projects in departments and agencies. Under the targets set by the CITU, all departments and agencies should have completed audits of equipment by January 1997. However, a survey undertaken at that time showed that only 34% of the 79 surveyed had met the target and that a further 24% had yet to start auditing systems.⁷⁹ In May 1997 the NAO reported that "most departments are still auditing systems and planning corrective action"⁸⁰—a full four months after audits were meant to have been completed. Indeed, in November 1997 departmental plans showed that a few departments were still in the audit phase.

47. From the same departmental plans it can be seen that only 36% of departments and agencies expect to complete their Year 2000 projects by December 1998—the date both set by the CITU as a target and suggested as ideal best practice. A further 46% expect to complete by March 1999 and 14% by mid-summer 1999. (A few departments have yet to stipulate project completion dates although, as the Chancellor pointed out, the work needed in these is largely in relation to PCs and not large or sensitive systems.)⁸¹ Some departments and agencies have already set priorities, identifying systems on which to concentrate efforts, and thus they are "correcting business critical systems and may leave systems of minor importance until later".⁸² This is clearly the right approach but, as the deadline for readiness is immutable, and as up-dated plans released in early March 1998 show that some departments and agencies have fallen further behind the timetable, we consider that more radical prioritisation is required. **We recommend that if, at the next quarterly review, any department or agency is shown to have fallen further behind the timetable, the Chancellor of the Duchy of Lancaster and the CITU should instigate a thorough analysis of that department's Year 2000 programme and assist it to identify and prioritise its key systems.**

OTHER PUBLIC BODIES

48. It is more difficult to assess progress in other public bodies, such as local government or the NHS, partly because far less information on compliance programmes has been made publicly available and partly because of the disparate nature of the large number of organisations concerned. Although the Chancellor of the Duchy of Lancaster has no responsibility beyond central Government, he has asked each Secretary of State to ensure that their department performs an exercise similar to the one he has undertaken in central Government in respect of the organisations they sponsor.⁸³ **We recommend that they should do so. We further recommend that the results of these reviews should be made available, as a supplement to**

⁷⁶Q. 415.

⁷⁷Q. 430.

⁷⁸Q. 362.

⁷⁹*Managing the Millennium Threat*, p. 9.

⁸⁰*Managing the Millennium Threat*, para 2.1.7.

⁸¹Q. 401.

⁸²Ev.p. 88.

⁸³Q. 399.

CHAPTER TWO: SCALE AND POTENTIAL IMPACT OF THE PROBLEM

13. Although most of our witnesses agreed that the century date change could potentially force errors in almost any system, product or process that incorporates a date reference, there are various estimates of the number of systems that are likely to be affected.²² Taskforce 2000 told us that “most computer systems (large and small, old and new) and almost countless ‘embedded’ microprocessor chips are potentially affected”.²³ Several bodies have recently undertaken surveys to ascertain precisely how many systems and organisations will be affected. In 1997, PA Consulting found, in a comprehensive survey in the UK and Ireland, that only 3% of organisations felt that their systems would be unaffected by the century date change, with a further 6% not knowing whether their’s would be or not. The remaining 91% of respondents believed that the century date change either had or would have an impact on their organisation (see table 1).

Table 1

Expected Impact of the Century Date Change on Organisations	
Expected Impact	Percentage
Not impacted	3
Already impacted	20
Impact in 1997	3
Impact in 1998-99	51
Impact in 2000	17
Did not know	6
Total	100

Source: *Defusing the Millennium Time Bomb*, page 18.

14. Taskforce 2000 told us that, left uncorrected, “80 per cent of computer systems of all kinds ... and something between 10 and 30 per cent of embedded systems will fail in one way or another”.²⁴ Similarly, Greenwich Mean Time, a company formed specifically to address issues arising from the Year 2000 problem in PCs, told us that the majority of the 20 million PCs that are estimated to be in use in the UK at present will experience some form of hardware or software disruption.²⁵

15. While we can quantify the number of systems likely to be affected, such statistics provide no qualitative indication of the extent to which organisations are likely to be impacted. There is an enormous difference between the consequences of failures in minor systems, like a pocket calculator, and a failure in a system which performs business or safety-critical functions. Moreover, while organisations may be able to cope with the failure of one system without any serious repercussions, the outcome may be completely different if a number of systems, minor or otherwise, fail simultaneously. Consequently raw statistics give little indication of the nature or degree of risk that century date change related errors may pose either socially or economically. We attempt to address this issue below but, in doing so, are conscious that these assessments are based on the assumption that no corrective or preparatory measures had been taken.

²²eg. Ev.pp. 24 and 161.

²³Ev.p. 1.

²⁴Q. 6.

²⁵Ev.p. 164.

Potential Impact on Businesses and the Economy

16. The London Stock Exchange pointed out that there were few areas of commercial life “untouched by the implications of the Year 2000 date change” and most of our witnesses from the business community agreed that the consequences of failing to take remedial action would be significant.²⁶ For instance, SmithKline Beecham told us that “left unaddressed, the Year 2000 problem would arguably have been the biggest threat to business continuity that SmithKline Beecham has ever faced”.²⁷ Railtrack told us “unless addressed ... the problem would cause serious and prolonged damage to the operation and hence the viability of the whole of the rail industry”.²⁸ Shell UK believe that, had they taken no corrective action, “there would have been serious consequences in terms of failure to continue to supply oil and gas”.²⁹ Failures to continue to operate on such a scale would clearly not only have a detrimental impact on national GDP but would also have implications for the performance of other companies reliant upon the services provided by those that had failed. Therefore, even though the implications of non-compliance vary from system to system, **we find it incontrovertible that, in the absence of adequate remedial action to address the century date change problem, there would be a significant negative impact on the UK’s future economic performance.**

Potential Impact on Society

17. Other witnesses pointed to the potential of the century date change problem to affect individual citizens beyond the inevitable consequences of a downturn in economic performance. The Consumers’ Association told us that “there is ... the possibility of consumers suffering financial loss, major inconvenience or breach of data protection safeguards” as a result of failures in, for example, transactions, billing and credit rating systems in banks or credit card companies; insurance company records; social security payment systems; workplace salary systems; or local authority administration systems.³⁰

18. Malfunctions or failures in systems which perform safety-critical or essential operations, such as air traffic control systems; road or rail signalling; medical equipment; safety control equipment in factories or equipment controlling the labelling, storage and distribution of perishable foods, would present more fundamental risks to the public. For example, Thames Water, whose operational monitoring and control systems for major water and waste processes are dependent on embedded systems, told us “any failure of our services for a significant period of time would have a potentially serious impact on the public health of millions of people”.³¹

19. Assessments of the nature of the problem and the potential impact that widespread malfunctions in computer and embedded systems could have on the economy, the national infrastructure and society at large, are important as they provide the imperative behind remedial action. However, as the Institution of Electrical Engineers told us, there has been “much ‘hype’ and scare mongering” in some reporting of Year 2000 issues and that, at times, “the consequences of failure to deal with the problems have been exaggerated”.³² Though predictions of doom generally have failed to account for the fact that some remedial action has already been, and continues to be, taken **we, like the majority of our witnesses, conclude that the century date change problem could, if not solved, cause severe difficulties in many critical public services.**

²⁶ Ev.p. 170.

²⁷ Ev.p. 183.

²⁸ Ev.p. 139.

²⁹ Q. 145.

³⁰ Ev.p. 221.

³¹ Ev.p. 159.

³² Ev.p. 161.

acknowledged skills shortage in at least three of the areas needed to undertake most compliance projects—project management, software engineering and embedded chip engineering (see paras 82–84). This may affect SMEs more than large corporations as the former are less likely to have in-house staff with the necessary skills. So, while delaying Year 2000 projects until 1999 may be a reasonable position for any one SME to take in isolation, such shortages are likely to result in the combined demands of a large number of SMEs exceeding the available supply of skilled labour. This, coupled with the demands of customers and suppliers for reassurances on millennium readiness, means that SMEs in general should take remedial action earlier rather than later.

59. We are less concerned about the very smallest businesses, some of whom may not be critically dependent on IT systems. Indeed a recent quarterly survey from the Forum for Private Business, a representative body for small businesses, shows that some 10% of its members have no computer hardware or software.⁹⁶ In some of these cases, it may be quite legitimate to argue that the century date change poses a lesser risk to the business than other concerns such as the demands of self assessment for taxation or protracted transport delays. Nevertheless, there is still a likelihood that these organisations are dependent on embedded systems of some sort such as a fax machine or a building management system and therefore they do need to take some precautionary action.

60. The scale of disruption that widespread failures in SMEs could potentially cause for the whole economy should not be understated. It is estimated that there are some 3.7 million business enterprises in the UK, with SMEs making up more than 95% of the total. Larger companies who have amassed expertise on Year 2000 issues have a valuable role to play in stimulating action on behalf of those SMEs who are their suppliers, customers, trading partners or form some other vital part of the business chain, and some have done so.⁹⁷ Indeed, many recognise that it is in their own best interests to do so. For instance, we were impressed by what Shell UK told us of their work with suppliers which involves disseminating best practice and passing on expertise.⁹⁸ Action 2000 are now working with a number of larger companies to encourage them “to share their experience to assist those companies whose preparations are less advanced”—a development which we welcome.⁹⁹

61. Nevertheless, we obviously cannot rely solely on a few large companies to stimulate action on behalf of millions of SMEs. A more pro-active and direct approach is needed to ensure that every SME is made fully aware of the business implications of the century date change. In January 1998, Action 2000 launched its ‘Millennium Bug’ campaign aimed primarily at SMEs. We would have preferred to see the campaign launched earlier but our main objective now is that its message should reach those for whom it is intended. We are concerned that a major part of the campaign consists of providing information over the Internet. As ICL told us, most SMEs either do not have access to the Internet or do not have personnel with the skills to find the information or put it to use.¹⁰⁰ While publication on the Internet is certainly worthwhile, Action 2000’s telephone helpline may reach a broader audience, but only if it is well publicised. Moreover, the helpline will only be effective if it can respond to all the demands placed upon it in terms of capacity and quality of information.

62. The BBA have developed a checklist aimed at small businesses—“a self assessment checklist to help guide businesses through the work needed to get them ready for Year 2000”, which some of their members are already using as a basis for discussions with their business customers, and suggested last year to Action 2000 that the scheme could be extended to become a standard checklist.¹⁰¹ We see considerable merit in this suggestion. Such a checklist could act as a useful reminder to businesses of the issues they need to consider. Perhaps more importantly, it could also provide a common reporting format thus reducing the need for

⁹⁶Forum for Private Business, *The Year 2000 and Computer Compliance*, February 1997.

⁹⁷eg. Ev.p. 22.

⁹⁸Q. 172.

⁹⁹Ev.p. 22.

¹⁰⁰Ev.p. 152.

¹⁰¹Ev.p. 109; Q.502.

businesses to respond separately to numerous requests for information on progress from, for instance, auditors, insurers, customers, bankers, shareholders, regulators or trading partners. The sooner the checklist is introduced, the more benefit it could be to businesses and those seeking information from them. **We recommend that Action 2000 develop a standard checklist to enable businesses to report progress in a common form as a matter of priority.**

63. Over the last few years the Government, and the DTI in particular, have put considerable resources into developing the Business Link network as a means of communicating with SMEs. As several witnesses argued, this network could now be used to reinforce the messages being sent to SMEs by other companies and Action 2000. There are also clear advantages in Action 2000 working, as it already does to some degree, in liaison with other organisations that have strong links with the SME community, such as local Chambers of Commerce. **Another means of reaching businesses directly would be to include information leaflets in telephone or other utility bills which are delivered to the vast majority of SMEs. We recommend that Action 2000 treat stimulating action on the part of SMEs with the highest priority and that it works with the Business Link network and other organisations in close contact with SMEs to ensure that its message is not only sent but received.**

IT Suppliers

64. It is vital that customers have information from IT suppliers regarding the state of compliance of products bought in the past and on possible upgrade or replacement equipment. Some companies, such as the Xerox Corporation, have made this information readily available.¹⁰² Like the Federation for Small Businesses we wish to see more companies doing this. However, we do have a concern about the business terms upon which such necessary upgrades or replacements are made available to customers. IBM told us that “it is common practice in the computer industry ... that suppliers create products and then they produce upgrades for those products ... that is normal marketing practice and accepted in the customer base and we charge for those up-grades”.¹⁰³ We accept that it is appropriate for IT suppliers to charge for upgrades when new or better products are actively sought by customers. **We do not accept that it is right to charge for upgrades necessitated by non-compliance of existing equipment. Depending upon the age of the current system and the terms under which it was supplied, companies have an obligation to provide suitable upgrades or replacements free of charge.** This obligation is morally impelling and sound business practice and we applaud those suppliers who have already committed to this position. Some of our witnesses suggested that there was also, in some circumstances, a legal obligation under the provisions of sale of goods legislation.¹⁰⁴

Progress in Key Sectors

65. We were most concerned to ascertain the extent of progress towards millennium readiness in those sectors which provide services on which society depends such as food distribution, transport, health care, power and water supply, telecommunications and financial and emergency services. We sought evidence from a range of organisations from these areas. To a large degree we were reassured by what we were told. Sainsbury's, “one of the top ten users of computer systems in the UK”, told us that they were confident that their preventative action, which involves the commitment of substantial resources, “will reduce the problem to manageable proportions” and that “major disruption is very unlikely”.¹⁰⁵ Thames Water said that “the problems that the company faces ... are significant, but also quite within our capabilities to solve” and that they were confident that their compliance programme, begun in 1996, would be “completed in time to avert detrimental consequences”.¹⁰⁶ We received similar evidence from BG plc (one of the two successor companies to British Gas), Railtrack, Shell UK, BT, the BBC, British Nuclear Fuels, the BBA, British Airways, the London Ambulance Service and others,

¹⁰²Q. 321.

¹⁰³Q. 238.

¹⁰⁴Sale of Goods Act 1979, as amended by the Supply and Sale of Goods Act 1994.

¹⁰⁵Ev.pp. 160 and 161.

¹⁰⁶Ev.pp. 159 and 160.

many of whom told us that they planned to complete the majority of work on Year 2000 projects by December 1998.¹⁰⁷

66. Nevertheless, not one of these organisations has yet completed their Year 2000 projects and all pointed out that projects were designed to reduce risks to manageable proportions rather than to achieve full compliance. Furthermore, most pointed out that while they were confident that their own systems would be adequately prepared in time, they were unable to predict whether other organisations on whom they were critically dependent would be.¹⁰⁸ This situation reinforces the need for adequate and integrated contingency plans to be drawn up and tested. Thus, **while it is important that each organisation develop its own contingency plans, there is a role for Government to ensure that alternative arrangements are in place should there be any interruption in the ability of providers of essential public services to deliver.**

Products Currently on the Market

67. It is reasonable to expect that electronic goods bought now will manage the century date change properly but we received much contradictory evidence over whether this was the case or not. IBM, for instance, told us that “the current models, versions and releases of IBM hardware and system software are Year 2000 ready today. In addition, more than 1,900 application packages are Year 2000 ready” and ICL that “all new and enhanced product releases produced by ICL are now millennium compliant”.¹⁰⁹ In contrast the Federation of Small Businesses told us that they had no confidence that any PC currently on the market was millennium compliant—a view supported by Greenwich Mean Time, who told us that 47% of PCs currently on sale “may be described as non-compliant at the hardware level”.¹¹⁰ We received less evidence in relation to larger computer systems or embedded systems. On the latter, however, the Consumers’ Association told us that “over the past two years, we have, as a matter of course, tested for millennium compliance every relevant domestic appliance which we have tested for our Which? reports. To date, we have not found any problems”.¹¹¹

68. We find it completely unacceptable that organisations and individuals purchasing goods today should be unable to rely on those goods to manage the century date change properly. We have drawn no conclusions as to whether particular goods are millennium compliant or not but it is clear that many have considerable doubts. Such doubts may lead some to postpone their own preparations for the century date change, thus compromising their own ability to achieve millennium readiness on time. Moreover, if those who choose to replace their existing non-compliant equipment with new versions find that such new equipment is also not compliant, their own millennium readiness will be compromised.

69. In January 1998, Action 2000, as part of its ‘Millennium Bug’ campaign, launched a ‘Millennium Safe’ logo. Businesses are encouraged to use the logo on their products “when they feel confident enough about their Millennium Bug projects or products to say in public that they are Year 2000 compliant”.¹¹² We would have preferred to see such a scheme in operation well before January 1998. Moreover, we are not convinced that this scheme is robust enough. As the Chairman of Action 2000 said “businesses will, I stress, be choosing to use the ‘Millennium Safe’ logo—it does not mean a product or supplier is Government approved”.¹¹³ While we accept that there would be enormous practical difficulties in a Government-backed certification scheme which carried guarantees, such as the need for independent testing and the possibility of exposure to liability claims if products backed by certification failed to manage the century date change, the certification scheme does need to be adequately policed. SmithKline Beecham told us that “to our dismay, many third-party software packages have produced date errors when subjected to validation challenge tests, despite vendors’ claims of compliance”.¹¹⁴ If usage of

¹⁰⁷eg. Ev.p. 138.

¹⁰⁸Ev.p. 140

¹⁰⁹Ev.p. 58 and 158.

¹¹⁰Ev.pp. 68 and 164.

¹¹¹Ev.p. 222.

¹¹²Speech given by the Chairman of Action 2000, 22 January 1998.

¹¹³Speech given by the Chairman of Action 2000, 22 January 1998.

¹¹⁴Ev.p. 185.

the Millennium Safe logo is not controlled it will not carry weight with those seeking validation nor will companies be encouraged to join the scheme as there will be no advantage in doing so. **We recommend that trading standards officers should monitor use of the Millennium Safe logo and that suppliers found using the logo on non-compliant equipment should be penalised.**

70. We are also concerned that the Millennium Safe scheme has not been adequately promoted. Unless purchasers of services or products are aware of the need to ask if products are backed by the scheme or understand what the Millennium Safe logo means when they see it the scheme will be ineffective. **We make below recommendations for a high profile advertising campaign on the part of Action 2000 (see para 73). We recommend that the Millennium Safe scheme is an integral part of that campaign.**

Best Practice

71. Several witnesses stressed the importance of disseminating 'best practice' as a means of helping organisations tackle Year 2000 issues and, indeed, as the CBI told us, several organisations "have emerged as exemplars of best practice",¹¹⁵ and have made public their processes for achieving millennium readiness. However, such information on best practice needs to reach all organisations, both to reduce the time and resources they need to devote to Year 2000 projects and to prevent unnecessary duplication of effort across different organisations. Action 2000 have already acknowledged this and guidance on best practice is included in its information pack. We welcome this but are concerned that not all those who need such information are in practice receiving it. **We recommend that Action 2000 treat the dissemination of best practice as a key part of its campaign to stimulate organisations to take effective remedial action.**

The Public

72. We have already discussed the impact on individual citizens of interruptions in the supply of goods or services on which they depend but there is also a "probably more widespread risk of malfunction in consumer equipment" which may cause little more than irritation.¹¹⁶ As well as the numerous PCs in domestic use which could fail to manage the date change properly, many homes have a plethora of equipment with embedded microprocessors, such as fax machines, some telecommunications equipment, video recorders or central heating controls. The Consumers' Association asked 500 people to test their video recorders, watches and fax machines; 187 replied and, of these, five had found problems with their watches, ten with their video recorders and two with their fax machines.¹¹⁷ However, no comprehensive study has been undertaken to assess the level of impact that the century date change is likely to have on equipment in peoples' homes. The Chancellor of the Duchy of Lancaster told us that the Government were considering performing sample audits on homes. **We recommend that this is done in order to establish public confidence.**

73. Given the statutory time limit of six years for those seeking redress, the Consumers' Association argued that "it is ... important for consumers who bought equipment four years ago to be aware of the opportunity to test that equipment and seek any necessary redress now".¹¹⁸ We agree. **We recommend that Action 2000 conduct a high profile campaign disseminating widely, in clear and non-technical terms, the information needed to test domestic equipment for millennium compliance.**

¹¹⁵Ev.p. 25.

¹¹⁶Ev.p. 222.

¹¹⁷*Ibid.*

¹¹⁸*Ibid.*

International Implications

74. Businesses in the UK economy are not only dependent on each other as suppliers, customers and service providers, but also on many companies and organisations overseas. However, several witnesses told us that, although it was difficult to obtain reliable information about the rate of progress in addressing century date issues in other countries, there was anecdotal evidence to suggest that most countries, with the exception of the United States and the Netherlands, were behind the UK in terms of both awareness and action. This is a matter of extreme concern to UK businesses, as both the Prime Minister and the Minister for Small Firms have acknowledged, especially those which conduct a substantial amount of overseas trade.¹¹⁹ The UK Government has no authority to compel organisations in other countries to take remedial action but it does have a role in monitoring progress overseas and in raising awareness through Government to Government contacts with other nations. We were pleased to note that the Minister for Small Firms raised the matter in the European Union Telecoms Council and welcome her commitment to take similar steps in other fora.¹²⁰ **We endorse the Government's decision to put the matter on the agenda of various international summits, including this year's G8 meeting and the recent Europe-Asia summit. We recommend that the Government continue to take every opportunity to raise century date change issues with foreign Governments and to put the matter firmly on the agenda with our neighbours and trading partners all around the world.**

75. In his speech on 30th March 1998, the Prime Minister acknowledged that there was also benefit from co-ordinating international activity and assisting other countries in taking action, saying that "we need to be able to take an overview of international activity ... and then co-ordinate efforts across the international spectrum ... once awareness is raised, countries will need expertise to identify and solve their critical problems".¹²¹ We agree and, therefore, support the Government's proposition that the G8 countries set up a council of experts.

76. Developing countries may have particular difficulties in achieving millennium readiness although, as the Department for International Development told us "the scale of the Year 2000 compliance problem in developing and transitional countries is not well understood".¹²² The World Bank surveyed 128 of their borrowing member countries and found that, of the 78 who replied, only 12 claimed to be prepared and only 15 others claimed to be aware of the problem. **We are concerned that developing countries' attempts to achieve millennium readiness should not be compromised by the provision of non-millennium compliant equipment from the UK.** The Department for International Development assured us that "equipment currently being supplied under UK aid through the Crown Agents is millennium compliant". There may be problems with equipment that has been supplied as aid in the past but, as ownership has passed to the recipients, the UK can only encourage developing countries to address readiness issues on old equipment.¹²³ We welcome the Government's decision to contribute £10 million, earmarked for assisting poor countries to identify and resolve century date change problems, to the World Bank's Trust Fund for Information Development. We, like the Prime Minister, hope that other countries will be able to contribute.

¹¹⁹Q. 142; Speech by the Prime Minister, 30 March 1998 on *The Millennium Bug*.

¹²⁰Q. 142.

¹²¹Speech by the Prime Minister, 30 March 1998, on *The Millennium Bug*.

¹²²Ev.p. 233.

¹²³Ev.p. 235.

CHAPTER FIVE: BARRIERS TO PROGRESS AND THEIR REMOVAL

Time

77. The short time between now and the century date change is the biggest constraint hindering organisations in their efforts to achieve millennium readiness, especially for those organisations which have yet to start their Year 2000 projects. Many systems will take months to fix and, given the pressures on resources and shortage of skilled personnel, many organisations need to concentrate on systems which are critical to business performance, health and safety or the environment. **We recommend that the need for prioritisation should be a central feature of the advice Action 2000 delivers.**

Awareness and Commitment

78. Many witnesses acknowledged that Taskforce 2000 has done much to make awareness high but, as survey results indicate, it is certainly not universal. Moreover, there are genuine concerns over whether awareness of the century date change problem has been widely converted into effective remedial action, particularly in SMEs. Many of our witnesses agreed that more needs to be done if those who have yet to appreciate the full implications of the century date change for their organisations are to be stimulated to take remedial action in time for such action to be effective. **We recommend that Action 2000 increase the profile and reach of its Millennium Bug Campaign. A campaign of the scale of 'Aids Awareness' in the 1980s or the more recent Inland Revenue's 'Self Assessment' information campaign would be appropriate.**

Open Reporting on Progress

79. Many witnesses felt that their ability to plan effectively their own millennium readiness projects was undermined by a lack of information on readiness, in other organisations. Although some organisations have been prepared to talk openly about their Year 2000 projects and their expected levels of readiness, most of our witnesses from the corporate sector were concerned that many of the organisations on which they depend have been too slow in providing reliable information on millennium readiness.

80. There is now little prospect of The Companies (Millennium Computer Compliance) Bill passing into law. This bill would have required all companies to report annually on the progress being made towards millennium readiness. However a similar, although not statutory, requirement has been placed on companies by the Accounting Standards Board. The Board's Urgent Issues Taskforce Abstract 20 requires directors to make specific and detailed disclosures of the potential impact of the century date change on their business and operations, and the company's general plans for addressing the potential issues that arise, in respect of all accounting periods ending on or after 23rd March 1998.¹²⁴ **We welcome this: most companies will have to report on their year 2000 status at least once, and many twice, before the millennium.**

81. Just as it is very difficult to obtain thorough and accurate information on the level of readiness in any one particular organisation, so it is almost impossible at present to obtain a clear measure of progress across either the public or private sectors. We have already recommended an effective reporting structure for those parts of the public sector not currently included in the Chancellor of the Duchy of Lancaster's reports (see para 27), but more information is needed in respect of private sector organisations, both as a whole and on a sector by sector basis. The various surveys that have been conducted to date, while providing useful information, frequently only provide a partial, or sometimes contradictory, picture. For Action 2000 to operate effectively and to target its efforts on sectors where there is greatest need, it will need to know which those sectors are. Moreover, contingency plans are more likely to be effective if those making the plans know what sort of contingencies should be planned for. Action 2000 told us that it "stands ready to contribute ... by gathering information on the state of preparedness, particularly in key sectors" and we welcome its commitment to undertake "systematic and

¹²⁴Urgent Issues Task Force Abstract 20, 5 March 1998, 'Year 2000 issues: Accounting and Disclosures'.

regular surveys”.¹²⁵ We recommend that Action 2000 commission a quarterly survey on progress in the business sector, broken down into categories including core services such as transport, telecommunications and other critical public services. We further recommend that the results of the survey be publicly and freely available.

Skills

82. Many of our witnesses said that shortages in some of the key skills needed for Year 2000 projects were, or would become, a major hindrance to making progress, especially for those organisations who have yet to start readiness work. Cap Gemimi told us that they expected that “demand for IT skills to fix the Year 2000 problem will exceed maximum available supply by April 1998”.¹²⁶ A similar conclusion was reached at the DTI’s skills conference last summer.¹²⁷ Other witnesses emphasised the fact that Year 2000 projects required skills in areas other than IT. These skills, such as project management, telecommunications engineers and electrical engineers are also in short supply. Taskforce 2000 suggested that the shortage was greatest in the skills needed to address the problem in embedded systems.¹²⁸

83. As the skills shortage increases, with more organisations putting demands on the same skills pool, it is inevitable that the costs of obtaining these staff will increase. Indeed some witnesses told us that this was already happening and research shows that wage inflation in specific skills areas, such as COBOL programming and IT project management, is already between two and four times the average.¹²⁹ Thus, the more an organisation delays its preparations for the Year 2000 the more it will have to pay for appropriately skilled staff, if indeed, it can find them at all.

84. Both the Government and Action 2000 have acknowledged these skills shortages and the impact they could have on the ability of organisations to conduct effective Year 2000 projects.¹³⁰ Action 2000 told us that addressing the skills shortage would be one of its top priorities. Indeed, one of Action 2000’s first initiatives was the creation of a skills project office, set up with funding from the DTI.¹³¹ In his budget speech in March 1998, the Chancellor of the Exchequer announced an additional £100 million in 1998–99 to “provide training in areas such as computers and high technology skills, not least to help prepare for the millennium”.¹³² A substantial part of this sum is to go towards tackling the century date change problem; £40 million is to be spent on setting up a network of ‘centres of excellence’ in IT training and a further £30 million will be used to assist SMEs in developing skills to assess and prepare their systems. The Government expect, given support from business, to be able to train 20,000 ‘Bug Busters’ by April next year. We welcome these developments but are aware that it will not be easy to train personnel to deal with the most complex aspects of the Year 2000 problem quickly.

Other Demands on IT Resources

85. Many of our witnesses argued that the skills shortage was exacerbated by other extraordinary demands currently placed on the same IT resources. The most frequently cited example was the introduction of European Monetary Union (EMU) on 1st January 1999, which, even without the UK joining in the first wave, involves many organisations, especially those in the financial sector, in complex alterations to IT systems. Taskforce 2000 told us that “the introduction of the Euro is having a major impact on resolving the Year 2000 problem ... we are doing the largest ever IT job we have ever done and the second largest IT job we have ever done at the same time”¹³³ and Lloyd’s of London that “the introduction of the Euro could not have

¹²⁵Ev.p. 14.

¹²⁶Ev.p. 135.

¹²⁷Q. 138.

¹²⁸Q. 30.

¹²⁹Ev.p. 44.

¹³⁰Q. 64; Q. 138.

¹³¹Q. 138; Q. 64.

¹³²Official Report, 17 March 1998, col 1103.

¹³³Q. 41.

happened at a worse time".¹³⁴ Consequently, a few witnesses called for a delay in the introduction of the Euro. In view of our opt-out, this is not a matter for the UK—where financial institutions seem to be well-prepared for those changes that will affect their business. However, the BBA also told us that British banks would not be in a position to cope simultaneously with millennium compliance and preparations for EMU had Britain been proposing to join in the first wave. Apart from anecdotal assurances, there seems to be no definitive information as to the preparedness of their European counterparts which is a matter we recommend the Government takes up during its presidency.

86. Witnesses also pointed out that other legislation and regulatory changes could put considerable demands on IT resources, such as the forthcoming implementation of EU Directives on Data Protection or the changes to telephone dialling codes.¹³⁵ The BBA told us that "it is terribly important that over this next vital two years the public sector keeps the demand for systems changes down to a minimum".¹³⁶ **We agree that it is important to keep demand for system changes down to a minimum.**

¹³⁴Ev.p. 156.

¹³⁵eg. Ev.p. 170.

¹³⁶Q. 506. See also eg. Ev. p. 179.

CHAPTER SIX: CONCLUSION

87. The century date change problem could, left uncorrected, cause a broad spectrum of automated systems to operate inaccurately or unpredictably. Although each failure in isolation is unlikely to have a significant impact the consequences of widespread and simultaneous failures could extend beyond technological fields to affect the overall performance of the economy and society at large. Substantial progress has already been made in correcting systems and to prepare to manage the consequences of failures but much remains to be done.

88. It is clear that many organisations responsible for the provision of essential public services have recognised the century date change problem and its wider implications and have undertaken programmes designed to minimise its impact. Although it is impossible to guarantee performance without degradation or interruption, we are reasonably content that widespread failures in key parts of the national infrastructure will be averted if current Year 2000 programmes for compliance are continued through to completion on time. However, we emphasise the need for integrated contingency planning.

89. Most large corporations have extensive Year 2000 projects underway but we still have concerns about the level of progress in some parts of the private sector, particularly in SMEs. These must be addressed.

90. The Government's acceptance of the importance and urgency of stimulating and enabling organisations in the private sector to take effective precautionary measures to prepare for the century date change has been matched by the commitment of substantial sums of public money.

91. Progress in the public sector is significantly behind the leaders in the private sector. Many public sector organisations, including some parts of central Government, are already projecting completion dates for readiness projects which are uncomfortably close to the millennium itself and which expose them to the risk of failures in systems before the century date change. Further slippage in timetables cannot be countenanced.

92. There is an overwhelming need for a high-profile campaign designed to educate organisations and the public on the implications of the century date change and to equip them to take effective remedial action. This would serve both to turn existing high levels of awareness into action and to counteract alarmist reporting.

93. There are two key elements to solving the Year 2000 problem. The first is information: information on best practice, on whether products are compliant or not and on the levels of progress that have already been made in specific organisations, in particular sectors and across the nation. Open reporting is essential and the Government, indeed the public sector as a whole, should be leading by example. Central co-ordination and wide dissemination of such information is essential if widespread duplication of effort is to be avoided. The second is prioritisation. Efforts to achieve millennium readiness must focus on critical systems. Each organisation needs to make strategic decisions over which systems are crucial to its survival. Similarly Government needs to ensure that systems on which the public rely for essential services, whether provided in the public or private sector, receive priority.

94. There is potential for problems as a result of systems failures caused by the century date change but, provided concerted and well co-ordinated action is taken to build on the progress already made, we believe that the UK can achieve an acceptable level of millennium readiness and celebrate the millennium without concerns about widespread disruption.

ANNEX A

Potentially critical dates which some systems may fail to manage correctly	
Date	Reason for criticality
1998	In some older programmes 1998 has been used as an indicator of a break in a file or sequence, particularly in systems where 1999 has been used to denote the end of file
1999	In some systems 99 has been used to denote the end of file
9th September 1999	Some systems may recognise “9999” as an end code and therefore shut down
December 1999	End of file indicator in some systems
31st December 1999/1st January 2000	Century date change
28th February - 1st March 2000	Some systems may not recognise 2000 as a leap year
31st December 2000	Some systems which have superficially handled the leap year in 2000 well may not be able to handle the 366th day.
28th February - 1st March 2004	Possible leap year problems
2024	This year has been reported as containing a date when there will be an overflow problem similar to 2038 (see below) but the precise date and cause have not been ascertained.
2030	This has been reported as a breakpoint in the windowing system used by Microsoft in a large number of their products. In these systems 29 will imply 2029 and 30 will imply 1930.
19th January 2038	At 03:14:08 on Tuesday 19th January 2038 the seconds counter used for date and time information in UNIX, C and C++ will reach 2,147,483,647 which is the largest number which can be stored as a 32-bit signed integer. As a result an overflow problem will occur and the value of the next number is unpredictable. Global time differences mean that it appears that the event will happen earlier in the States.

Sources: HSE; Shell UK; British Standards Institute, *A definition of year 2000 conformity requirements*, appendix b.

ANNEX B

The Definition of Year 2000 Conformity Prepared by British Standards Institute (Document Ref: DISC PD2000-1)

“Year 2000 Conformity shall mean that neither performance nor functionality is affected by dates prior to, during and after the Year 2000”

Rule 1

“No value for current date will cause any interruption in operation”

- This rule is sometimes referred to as *General Integrity*;
- If this requirement is satisfied, roll-over between all significant time demarcations will be performed correctly;
- *Current Date* refers to today's date as known to the equipment or software.

Rule 2

“Date functionality must behave consistently for dates prior to, during and after year 2000”

- This rule is sometimes referred to as *Date Integrity*;
- This rule means that all equipment and software must calculate, manipulate, and represent dates correctly for the purpose for which they were intended;
- The meaning of *functionality* includes both processes and the results of these processes;
- If desired, a reference point for date values and calculations may be added by organisations: eg as defined by the Gregorian calendar;
- No equipment or software shall use particular date values for special meanings; eg “99” to signify “no end value”, or “end of file”.

Rule 3

“In all interfaces and data storages, the century in any date must be specified either explicitly or by unambiguous algorithms or inferencing rules”

- This rule is sometimes known as *explicit/implicit century*;
- It covers two general approaches:
 - a) **explicit representation of the year in dates:** eg by using four digits or by including a century indicator. In this case, a reference may be inserted (e.g. 4-digit years as allowed by ISO standard 8601:1988) and it may be necessary to allow for exceptions where domain-specific standards (e.g. standards relating to Electronic Data Interchange, Automatic Teller Machines or Bankers' Automated Clearing Service) should have precedence.
 - b) **the use of inferencing rules:** e.g. two-digit years with a greater value than 50 imply 19xx, those with a value equal to or less than 50 imply 20xx. Rules for century inferencing as a whole must apply to all contexts in which the date is used, although

different inferencing rules may apply to different date sets.

Rule 4

“Year 2000 must be recognised as a leap year”

- The year 2000 is a leap year, whereas the years 1800 and 1900 were not. Hence for proper compliance there must be rollover from 28-02-2000 to 29-02-2000 (and subsequently to 01-03-2000), and from 28-02-1900 to 01-03-1900.

General Notes

For rules 1 and 2 in particular, organisations may wish to specify allowable ranges for values of current date and dates to be manipulated. The ranges may relate to the feasible life-span of equipment or products and/or the span of dates required to be represented by the organisation's business processes. Tests for specifically critical dates may also be added (e.g. for leap years, end of year, etc.). Organisations may wish to append additional material in support of local requirements.

Where the term century is used, clear distinction should be made between the “value” denoting the century (e.g. 20th) and its representation in dates (e.g. 19xx); similarly, 21st and 20xx.

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GLOSSARY

BBA	British Bankers' Association
CBI	Confederation of British Industry
CCTA	Central Computers and Telecommunications Agency
CITU	Central Information Technology Unit
DTI	Department of Trade and Industry
EMU	European Monetary Union
NAO	National Audit Office
NHS	National Health Service
PC	Personal Computer
SMEs	Small and Medium-sized Enterprises

DEFINITION OF TERMS

Embedded System	An electronic or electro-mechanical device, or series of devices, the function of which is controlled by one or more integral micro-processor or 'embedded' chip.
Mainframe	A powerful and expensive computer usually designed for providing shared computer applications between simultaneous end-users.
Millennium Compliant	Systems which will continue to function normally before, during and after the century date change.
Millennium Ready	<p>A term used to denote those systems which have been tested for millennium compliance and for which, either before or after remedial work, one or more of the following is true:</p> <ul style="list-style-type: none"> • the system has no date function; • the system is millennium compliant; • non-compliance will not affect the operations for which the system is used. • the users of the system have made adequate plans to manage the consequences of non-compliance.
Personal Computer	A computer designed for use by a single user. It may be 'stand alone', connected by a telephone line to the Internet or—as is usually the case—the a commercial environment—connected to a server providing common services to several users.
Server	A general term describing computers (including mainframes) which provide shared computer resources (databases, printers, etc.) to users of connected personal computers.

PROCEEDINGS OF THE COMMITTEE RELATING TO THE REPORT

WEDNESDAY 1 APRIL 1998

Members present:

Dr Michael Clark, in the Chair

Mr David Atkinson
Mr Nigel Beard
Dr Ian Gibson
Dr Lynne Jones

Dr Ashok Kumar
Dr Desmond Turner
Dr Alan W Williams

The Committee deliberated.

Draft Report (The Year 2000 – Computer Compliance), proposed by the Chairman, brought up and read.

Ordered, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 94 read and agreed to.
Annexes read and agreed to.

Resolved, That the Report be the Second Report of the Committee to the House.

Ordered, That the Chairman do make the Report to the House.

Ordered, That the provisions of Standing Order No.134 (Select committees (reports)) be applied to the Report.

Several Papers were ordered to be appended to the Minutes of Evidence.

Ordered, That the Appendices to the Minutes of Evidence be reported to the House.

Several Memoranda were reported to the House.

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